

CENTER FOR BEAM PHYSICS SEMINAR

“High-Temperature Sustained Spheromak Plasmas in the SSPX Device”

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Albert Ghiorso Conference Room (71-264), LLNL
●●●*Refreshments served at 10:20 AM* ●●●

Abstract: Using a combination of vacuum and plasma wall conditioning, we have produced clean spheromak plasmas with peak electron temperatures of ~ 200 eV. The wall conditioning reduces impurity concentrations and impurity radiation: $Z_{\text{eff}}=2.5$ and $P_{\text{rad}}/P_{\text{in}} < 15\%$. In parallel with the wall conditioning, we operate the spheromak near its formation threshold current so as to produce relatively flat internal current profiles, which minimize the magnetic fluctuations. Simple calculations show that the ohmic heating time is consistent with the observed rise in electron temperature. Peak normalized plasma pressures of $\sim 10\%$ are measured in these discharges. Future work to increase the internal magnetic field and thereby allow higher temperature operation, will be discussed.

Biographical data and research interests: Dr. Hill works in the Fusion Energy Program at LLNL as the spheromak program leader. Prior to this, he led the divertor physics group for the DIII-D tokamak program at General Atomics in San Diego. David received his Ph.D. in plasma physics from the University of California, Irvine in 1983 and has worked for LLNL since then.